ANNUAL ADMINISTRATIVE REPORT (FY 2004) AND

WORK PLAN (FY 2005) FOR INVENTORIES AND VITAL SIGNS MONITORING

FY2004-FY2005

MID-ATLANTIC NETWORK (MIDN)

Shenandoah NP (SHEN) (Prototype Park), Booker T. Washington NM (BOWA), Richmond National Battlefield Park (RICH), Appomattox Court House NHS (APCO), Petersburg National Battlefield Park (PETE), Fredericksburg and Spotsylvania NMP (FRSP), Gettysburg National Military Park (GETT), Eisenhower National Historic Site (EISE), Hopewell Furnace NHS (HOFU), and Valley Forge National Historical Park (VAFO)

Mid-Atlantic Network Approval Signatures

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I. Overview and Objectives

The Mid-Atlantic Network (MIDN) includes ten parks with significant natural resources. All of the parks are located in Virginia and Pennsylvania. In October 2001, the Mid-Atlantic Network Inventory Study plan was submitted to WASO and the Network received funds in FY02 to begin implementing inventories on vertebrate and vascular plants in network parks. Vertebrate inventories are underway to address the lack of information in five of the six VA parks in the Network. The four PA parks in this network were fortunate to have received substantial funding for biological inventories prior to the establishment of I&M networks. Shenandoah National Park, a prototype park, had completed much of their inventory work prior to establishing their monitoring program, and recommended devoting the limited funds to the smaller VA parks. Although SHEN is an integral part of the Network, as a prototype, SHEN reports progress under a separate Annual Administrative Report and Work Plan.

The Appalachian National Scenic Trail (APPA) covers 14 states and 5 networks in the east, but was included in the MIDN for inventory purposes in 2000 and the Network has reported on progress regarding the APPA from 2000-2002. APPA received separate funding for biological inventories that was added to the MIDN up to FY 2004. To reduce the workload on APPA staff, the Northeast Temperate Network has included APPA in their network and report on these activities within the Annual Administrative Report and Work Plan for the Northeast Temperate Network.

In 2001, subject matter experts attended a scoping workshop involving only the VA parks to help identify gaps in vertebrate and vascular plant inventory information. One of the outcomes of this workshop was the submission of a number of proposals from well-known taxonomic experts who attended the workshop in Richmond. Budgets in inventory proposals exceeded the biological inventory funding available for MIDN in FY02 so, when several Northeast Coastal and Barrier Network projects were not ready to fund in FY02, Mid-Atlantic Network projects, ready to go, were funded. The Mid-Atlantic Network reimbursed the Northeast Coastal and Barrier Network in FY03 and FY04.

Projects that are ongoing for 2003-2004 in the Network include, compiling and entering existing data, into NPSpecies, NatureBib and the Dataset Catalog. The NPSpecies database for all parks has been reviewed and is verified and current. We are awaiting the addition of vertebrate inventory data for the VA parks and floristic data from the Plots database resulting from vegetation mapping projects prior to certifying the database. Taxonomic experts have been identified to review NPSpecies for some of the parks in the Network and that work will continue in 2005, once each park's database has been completed and all inventory data has been entered. The cooperative agreement with Penn State University (PSU) to update NatureBib for the four Northeast Region Networks, including the Mid-Atlantic Network, has been extended. The database is up to date for all network parks. The research associate from PSU hired to correct and update NatureBib has been visiting each park to search for new documents and update existing information.

Product specifications that specify formats for deliverables, such as, FGDC compliant metadata for all spatial data sets, FGDC Biological Profile for all biological data sets, and relational databases in MS Access were included in each cooperative agreement. The Northeast Coastal and Barrier Network data manager assisted and/or developed relational databases for cooperators working on biological inventories to assure quality products at the completion of each project.

Deliverables from the inventory projects funded by I&M and regional science in FY02 for the five VA Network parks, APCO, BOWA, FRSP, PETE, and RICH, will be submitted in 2005. These projects

were funded after the development of I&M product specifications and will comply with these guidelines. Reports are peer reviewed for content and databases are reviewed for accuracy and error.

Vegetation mapping is underway in all of the network parks. We are awaiting the final reports and deliverables from VAFO and HOFU and those will serve as an example for us to develop a review process for vegetation mapping products, which was drafted this year. Mapping in VA parks is continuing and has been extended due to impacts of Hurricane Isabel in 2003 and in an effort to improve on accuracy assessment procedures.

The Mid-Atlantic Network received $150,000 start-up funding in 2004 to begin developing a monitoring program. The Network Coordinator was hired in May, and has established the Network office at Fredericksburg NMP. Hiring the Network Data Manager has been delayed until 2005, and support has been provided through a cooperative agreement with North Carolina State University. The Network Coordinator has conducted site visits to all the network parks. Additional support in compiling information for the Phase I report has been provided by the Regional Natural Landmarks Coordinator.

Objectives

Biological Inventories

1. Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
2. Conduct inventories targeted at vertebrate and vascular plant species in the Network parks and conduct quality assurance and review of all inventory products.
3. Conduct investigations on species and species assemblages that are of special concern to network parks and conduct quality assurance and review of all inventory products.
4. Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program and conduct quality assurance and review of all inventory products.

Vital Signs Monitoring

5. Hire and retain professional staff and provide a safe, healthy, and productive work environment.
6. Develop and maintain working and decision-making processes that engage the network board of directors, technical staff, cooperators and managers of network parks.
7. Develop, implement, and maintain a Network data management program. (Note: this objective is placed under Vital Signs monitoring, however, it is equally important and integrated with the Biological Inventories portion of the program.).
8. Identify and prioritize Network Vital Signs, develop protocols and implement programs to monitor these Vital Signs in Network parks.
9. Integrate water quality monitoring in the Network Vital Signs monitoring plan.

II. Accomplishments (FY2004) and Scheduled Activities (FY2005)

A. Biological Inventories

Objective 1 –Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.

Task 1.1 – NPSpecies (all parks)

- **FY 2004 Accomplishments:** Through an existing cooperative agreement with Penn State University (PSU) a part-time research associate continued to convert and verify existing data in the

Network's NPSpecies database (this position is shared between two Networks, the Mid-Atlantic and Eastern Rivers and Mountains). **(1)** Existing records in NPSpecies have been verified and corrected in association with the original hard copy documents. This included verifying each species with its associated reference, identifying species in the database not referenced and removing them, addition or removal of documented common or scientific names, and adding locational information, abundance and nativity information. Spelling errors were also corrected, and any new data gathered in 2003 and 2004 entered. **(2)** Completed databases have been submitted for APCO, BOWA, FRSP, and RICH. **(3)** The bird data for EISE, GETT, HOFU, and VAFO were certified for accuracy by a taxonomic expert at PSU. **(4)** The research associate has co-authored three unpublished NPSpecies documents: NPSpecies Data Entry Standards Manual, Data Certification Guide, and the Northeast Region Inventory and Monitoring Program NPSpecies Data Management Plan. **(5)** Completed data requests and document searches as needed.

- **Scheduled FY 2005 Activities and Products: (1)** Enter new data as it becomes available for all parks in the MIDN. **(2)** Assist taxa experts with data certification on an as-needed basis for all parks. **(3)** Provide assistance through data requests and document searches as needed.

Task 1.2 NatureBib (all parks)

- **FY 2004 Accomplishments:** Through an existing cooperative agreement with PSU, a full-time research associate is entering and verifying existing references in the NPS bibliographic database, NatureBib. This is a shared position between the four Northeast Region Networks. In order to locate new records for inclusion into each park database, update work includes visits to the parks, as well as searches and/or visits to local, state, and federal public, private, educational, and governmental libraries and repositories. Online databases and resources are also searched for relevant natural resource information via the Internet or locally. Also included in this updating is the editing of the existing records for duplication, authority control, and data enhancement due to multiple sources, non-NatureBib originated cataloging. **(1)** Site visits were made to PETE, SHEN, and VAFO, and new records were added: PETE (263 records), SHEN (586 records), and VAFO (30 records). **(2)** Additional editing of existing records was conducted for PETE (109 records), SHEN (617 records), and VAFO (21 records). **(3)** Data requests including data retrieval and bibliographic instruction were fulfilled for NPS staff. **(4)** The draft Northeast Region NatureBib Data Management Plan and draft Northeast Region NatureBib Data Entry Manual have been completed. **(5)** VAFO park personnel have been assisted through scoping sessions to assess the collection and to present cataloging and archiving options.
- **Scheduled FY 2005 Activities and Products: (1)** Complete the update and verification of NatureBib, including park visits where needed. **(2)** Conduct additional editing and verification of existing records in NatureBib. **(3)** Fulfill NatureBib database data requests as needed. **(4)** VAFO Natural Resource Collection will be cataloged and archived.

Objective 2 –Conduct inventories targeted at vertebrate and vascular plant species in the Network parks and conduct quality assurance and review of all inventory products.

Task 2.1 – Mammal Surveys (FRSP, RICH)

- **FY 2004 Accomplishments:** A cooperative agreement was established in FY2002, with Dr. Ron Barry through the CESU at Frostburg State University (FSU), to conduct a two-year study to determine the presence, relative abundance, and distribution of small, medium, and large mammal species at RICH and FRSP and three Northeast Coastal and Barrier Network parks. **(1)** Surveys were continued at RICH. UTM coordinates were obtained by GPS at each sampling location, and measurements of habitat variables were made at 9 of the 11 units in the park. Data were compiled in MS Access format. Nineteen species of nonchiropteran mammals were confirmed at RICH,

including 2 new species in FY 2004. **(2)** Surveys were initiated at FRSP. UTM coordinates were obtained by GPS at each sampling location, and measurements of habitat variables were initiated. Data were compiled in MS Access format. Eleven nonchiropteran species were confirmed in FY 2004, all new records. **(3)** A progress report on inventorying activities at RICH and FRSP was submitted in January 2004.

- **Scheduled FY 2005 Activities and Products: (1)** Dr. Barry and his team will complete the survey of mammals in RICH in the fall 2004. **(2)** Data will be compiled and analysis will begin in December 2004. Within-park species distributions, relative abundances, and species-diversity measures will be determined after sampling has been completed. **(3)** Avi Sareen's FSU M.S. thesis on the effects of prescribed burning on small mammal species diversity in forested habitat in Richmond National Battlefield Park will be prepared. **(4)** Mammal sampling will continue throughout FRSP through FY 2005. Measurement of habitat variables will begin. **(5)** The preparation of the species electronic data sets and the GPS data for sampling locations and observation sites for the 2 parks will constitute final products for the project.

Task 2.2 – Mammal Surveys (BOWA, PETE, APCO)

- **FY 2004 Accomplishments:** A cooperative agreement was established (FY 2002) with Dr. John Pagels, Virginia Commonwealth University (VCU), to conduct a two-year study to determine the presence, relative abundance, and distribution of small, medium, and large mammal species at APCO, BOWA and PETE. **(1)** A literature search was completed to determine all mammals that may potentially occur at each of the study areas. **(2)** Trapping continued during the fall, winter, spring, and summer seasons at the three parks and has now been completed. To date, a total of 859 mammals belonging to 21 species have been captured in the three parks. **(3)** Camera trapping was used during each trapping session in addition to live and pitfall traps. Using night camera traps, *Felis rufus* (Bobcat) and *Canis latrans* (Coyote) were documented in Dinwiddie County within PETE (Five-Forks) boundaries. This brings the mammal species count to 21 at PETE, 19 at APCO, and 18 at BOWA. **(4)** Vegetation measurements were made at all trapping sites including understory as well as overstory measurements. **(5)** Field capacity was determined for soil samples previously collected. **(6)** Data were entered into NPS database for further analysis.
- **Scheduled FY 2005 Activities and Products: (1)** Dr. Pagels and his team will complete data entry and analysis between October 2004 through January 2005. **(2)** GPS information will be taken at every trapping location in October and November 2004. **(3)** Final vegetation measurements will be taken at that time. **(4)** The NPS database will be submitted along with the draft report in mid-winter 2004-2005, and the final report will be completed in 2005.

Task 2.3 – Bat Surveys (GETT, EISE, HOFU, VAFO)

- **FY 2004 Accomplishments:** A cooperative agreement was established with Jim Hart of the Pennsylvania Science Office of The Nature Conservancy, to conduct an inventory of bats in the Pennsylvania MIDN parks. The following activities were conducted in 2004: (**1)** Five survey sites were mistnetted over the course of ten nights within GETT and EISE including one site along Plum Run in the vicinity of Devil's Den, two sites on Plum Run along the southern boundary of GETT, one site along Willoughby Run within EISE near the John D. Eisenhower Bridge and one site on Rock Creek near Spangler's Springs. Ninety-two man-hours resulted in the capture of 31 bats of three species including 5 northern red bats (*Lasiurus borealis*), 2 little brown bats (*Myotis lucifugus*) and 24 big brown bats (*Eptesicus fuscus*). A combination of factors precluded further work during FY04 including the late acquirement of a signed agreement, wet weather and high water at several planned survey sites. **(2)** Six barns were visually inspected for indication of use as roosts by bats. Of the six barns surveyed, the Codori, Spangler and Sherfy Barns all had indication

of usage by bats in the form of guano while big brown bats were actually spotted in the Sherfy Barn.

- **FY 2005 Scheduled activities and products**: **(1)** During November and December, 2004, site reconnaissance will be conducted at VAFO and HOFU to determine what sites will likely be surveyed during the field season of 2005. These will be based on habitat suitability and access. **(2)** During May-August, 2005, mist-netting surveys will be conducted at VAFO and HOFU at sites previously selected during winter reconnaissance. **(3)** During mist-netting surveys at HOFU and VAFO, surveys of structures likely housing roosting populations will be surveyed. **(4)** During June-July, 2005, surveys at GETT/EISE will continue at two sites.

Task 2.4 – Avian Surveys (FRSP, RICH, BOWA, PETE, APCO)

- **FY 2004 Accomplishments:** Through a cooperative agreement with the Center for Conservation Biology at the College of William and Mary, Dr. Dana Bradshaw completed field work in the winter of 2003/04 finishing 15 months of data collection towards a year-round inventory of birds. A team of four field technicians was used to conduct repeated rounds of sampling. Surveys were conducted from a matrix of fixed sampling points covering all habitat types within each park. Additional information was gleaned from Breeding Bird Survey data, Christmas Bird count data, and other standardized counts where available toward creating a comprehensive bird profile for each park. Data compilation and analysis was underway throughout the remainder of FY 2004 with draft final reports nearing completion for the first of the parks. Field work in the fall and winter of 2003 was hampered by significant forest damage from Hurricane Isabel which struck the region on September 18, 2003.
- **Scheduled FY 2005 Activities and Products:** Dana Bradshaw will complete draft and final reports for avian survey efforts in the five Mid-Atlantic Network (MIDN) parks. Reports will include habitat and bird inventory data for all units of each park, in addition to historical data where available. Data will span all seasons and include aerial image maps of point locations and nomenclature. Long-term monitoring recommendations and management suggestions where appropriate will be presented for each park. Additional work will be carried out toward updating the NPSpecies database for each park and certifying data already entered. Draft and final reports are due March 1, and June 1, 2005 respectively.

Task 2.5 – Herpetological Surveys (FRSP, RICH, BOWA, PETE, APCO)

- **FY 20034 Accomplishments**: **(1)** Through a cooperative agreement with Dr. Joseph Mitchell, University of Richmond, herpetological inventories at FRSP, RICH, BOWA, PETE and APCO began in October 2002 and continued through July 2004. A total of 17 species of amphibians and 13 reptiles have been documented thus far for APCO, 9 and 9 for BOWA, 21 and 21 for FRSP, 20 and 27 for PETE, and 23 and 21, respectively, for RICH (24 and 27, respectively, total). New county records and range extensions for several species, mostly frogs and salamanders, have been documented. Park personnel supplied information and in some cases photographs of amphibians and reptiles they encountered. Resource managers in two parks provided frozen road-killed snakes. These valuable observations provided new information on several species. **(2)** An MS Access relational database was developed for the herpetological inventories in these parks, by the Northeast Coastal and Barrier Network data management staff. All data have been entered into the database and a copy sent to the I&M coordinator for the Mid-Atlantic region for evaluation.
- **Scheduled FY 2004 Activities and Products**: **(1)** A no-cost extension to complete data file and report products for this project has been provided. All deliverables will be furnished by March 2005. **(2)** Field work has been completed for all five parks in this I&M project and no further activities are foreseen. **(3)** During this FY, final evaluation of the Access data file will be completed, maps generated, and final reports will be produced.

Task 2.6 – Fish inventories (APCO, BOWA, EISE, FRSP, GETT, HOFU, PETE, RICH, VAFO)

- **FY 2004 Accomplishments: (1)** During 2004, inventory efforts were completed within APCO, BOWA, EISE, FRSP, GETT and VAFO by SHEN staff. Stream sections within APCO and BOWA were resampled during late spring to provide some contrast to the late summer sampling effort within these parks in 2002. Selected stream sections within FRSP were resampled during early spring in an attempt to detect anadromous shad and again in late summer to take advantage of a return to normal flow conditions following the drought of 2002. Intensive sampling efforts were completed in stream sections within EISE and GETT during August and early September. During early October, a crew from the Pennsylvania Fish and Boat Commission (PFCB) completed an electrofishing survey along the section of the Schuylkill River that flows through VAFO. Sampling efforts within EISE and GETT also included personnel and equipment from the PFBC. In addition to participation from the fisheries biologist and crew from Shenandoah National Park sampling efforts within APCO and BOWA included equipment and personnel from the Virginia Department of Game and Inland Fisheries (VDGIF). A total of 15 sites along 10 streams were sampled in all of the parks combined in 2004. A number of fish species were added to the network parks inventory this year both within streams that had been previously sampled and within streams that were sampled for the first time during 2004. All associated data entry and verification were completed for the 2004 field season during September. **(2)** Penn State Institutes for the Environment published the fisheries survey for HOFU resulting in 17 species recorded for the park.
- **FY2005 Scheduled Activities and Products: (1)** Revised or new park specific databases will be prepared and submitted to all parks sampled during 2004 and the most recent data will be submitted for entry into NPSpecies. Additionally, an annual progress report including data summaries and maps of sampling locations for 2004 will be completed. **(2)** During 2005, SHEN staff will work cooperatively with the VDGIF to conduct electrofishing surveys within the Conservation Fund Property along Beaverdam Creek at RICH. This survey effort is the last remaining field component of the fish species inventory within the Mid-Atlantic Network parks. **(3)** SHEN staff and network coordinator will link to NCBN network to share information and gain a better regional perspective of fisheries in VA and MD.

Task 2.7 – Compilation of Historic Data for Fishes of the Northeast Region

Parks Involved: VAFO, HOFU, GETT, EISE, RICH, APCO, PETE, FRSP, BOWA

- **FY 2004 Accomplishments:** Continued effort of regional I&M and ERMN staff to develop database format to assist completion of past project with Penn State University (Dr. Jay Stauffer and Tim Stecko) to provide fish distribution, voucher and species data for PA, VA and WV parks from an earlier cooperative agreement.
- **Scheduled FY 2005 Activities and Products:** Project will be completed and final deliverables received.

Task 2.8 – Biotic Surveys with special attention to asbestos release sites (VAFO)

- **FY 2004 Accomplishments: (1)** Historical records research and compilation were conducted, and Draft and Final Study Plans were completed. **(2)** HAZWOPER training (for work in asbestos sites) was completed by Penn State field technicians. **(3)** Fourteen Areas of Concern (AOCs) in the Asbestos Release Site were surveyed for herpetofauna and small mammals, resulting in documentation of 15 herp species and 3 small mammal (chipmunk-sized and smaller, not including bats) species. Additionally, eight "larger" mammal species and an unidentified bat species were documented in the Areas of Concern, bringing the mammal total in the Asbestos Release Site to 12 species. None of the 15 herp species detected represented new records for the park, according to the NPSpecies database. One of the mammal species (coyote) was a new record for the park.

(4) The Schwoebel Tract (now officially called "Wagonseller Farm" by NPS) was surveyed for herpetofauna, mammal, bird, and woody plant species. Researchers documented 11 herp, 14 mammal, and 72 bird species (preliminary numbers). Species totals have not yet been summarized for woody plants. None of the 11 herp or 72 bird species represented a new record for the park. However, domestic cat and the potential weasel sighting (not listed in total) would represent new mammal records. **(5)** Mammal surveys documented 20 mammal species at VAFO, not including the questionable sighting of a weasel, of which the big brown bat, coyote, and domestic/feral cat represent new records for the park. Additionally, it is possible that Maryland shrew was encountered, pending confirmation from specialists' study voucher specimens.

- **FY 2005 Scheduled Activities and Products: (1)** Nov 2004: enter all field data into an electronic database. **(2)** Nov/Dec 2004: GPS all field survey locations. **(3)** Nov 2004 – May 2005: Analyze data, write final reports Parts I-III, and create MS Access database for final storage of field data. **(4)** May – Sep 2005: Submit final reports, MS Access database, and all associated metadata files.

Task 2.9 Relational database development for PA Park inventories (GETT, EISE, VAFO, HOFU)

- **FY 2004 Accomplishments**: A cooperative agreement was established with NC State to provide support for relational database development of PA parks. **(1)** Initially the goal of this project was to develop standardized natural resource databases to support management planning at VAFO. All deliverables due under the initial agreement were completed in FY 2003. The final report for this project was submitted in January 2004. **(2)** In September 2002, the initial agreement was amended to assist with developing standardized natural resource databases for up to six additional parks. During FY 2004, NCSU completed a review of spatial data and associated databases for the Bird and Butterfly Inventory for ALPO and JOFL (ERM Network), and completed review of data for the Bird, Herp, and Mammal Inventory for HOFU, GETT, EISE, and VAFO conducted by Yahner.
- **Scheduled FY 2005 Activities and Products:** NCSU will continue to review data sets as they are completed by our cooperators.

Task 2.10 Assist cooperators with developing FGDC compliant metadata for biological inventories (All parks)

- **FY2004 Accomplishments**: Discussions among cooperators, data managers, and I&M staff in the Northeast identified the need to provide support to cooperators in developing FGDC compliant metadata for their projects. Currently in the Mid-Atlantic Network there are eight cooperators at different Universities conducting biological inventories in the Network parks. The region itself has many more. An amendment to the existing cooperative agreement with NCSU Field Technical Support Center (FTSC) was funded by all 4 networks in the region to train undergraduates at NCSU to develop FGDC compliant metadata following the biological profile. **(1)** NCSU initiated the process of developing metadata for the Bird, Herp, and Mammal Inventory for HOFU, GETT, EISE, and VAFO conducted by Yahner. Additional information has been requested from Yahner's staff to complete FGDC compliant metadata for this project.
- **Scheduled FY 2005 Activities and Products**: **(1)** Trained students will continue to directly assist Northeast Region I&M cooperators with the development of FGDC compliant metadata for all projects. **(2)** As soon as the information requested from Yahner's staff, NCSU will complete metadata and review of the Bird, Herp, and Mammal Inventory for HOFU, GETT, EISE, and VAFO. **(3)** A final report will be prepared and submitted for this project by December 31, 2004. **(4)** As data becomes available from other MIDN cooperators, NCSU will continue to provide technical support in reviewing data compliance.

Task 2.11 Peer review of biological inventory work (All parks)

- **FY2004 Accomplishments**: **(1)** A cooperative agreement was amended in 2003 with Penn State

University, Dr. Richard Yahner to provide funding for scientific peer review of incoming vertebrate inventory data and reports for the Mid-Atlantic Network and some projects being conducted in the Eastern Rivers and Mountains Network parks**.**

- **Scheduled FY 2005 Activities and Products**: **(1)** Continue peer review as data and reports are submitted to the Mid-Atlantic Network from Ron Barry (mammals), John Pagels (mammals), Joe Mitchell (reptiles and amphibians), and Dana Bradshaw (birds).

Task 2.12 Museum collections (SHEN)

- **Scheduled FY 2005 Activities and Products**: **(1)** SHEN staff members will begin discussions with staff at the Virginia Museum of Natural History to determine if the museum could serve as a central repository for natural history collections. A cooperative agreement would be negotiated with the museum. SHEN would serve as a pilot effort that potentially could be expanded to include other MIDN parks.

Objective 3 – Conduct investigations on species and species assemblages that are of special concern to network parks and conduct quality assurance and review of all inventory products.

Task 3.1 – Crayfish Inventory

Parks Involved: HOFU, VAFO, GETT, EISE

- **FY 2004 Accomplishments: (1)** A cooperative agreement was established between Dr. Bob Carline and Dave Lieb of Pennsylvania State University to inventory crayfish species at Pennsylvania NPS units. Introduction of non-native crayfish species are a great threat to native crayfish, especially in PA, but resource managers lack sufficient baseline information. The inventory will result in updated crayfish species lists for each park. **(2)** A preliminary survey plan was developed during the summer of 2004.
- **FY 2005 Scheduled Activities and Products: (1)** Meetings between Park Service and University personnel will be held during the fall and winter of 2004-2005 to discuss and refine the survey plan. **(2)** The survey plan will be finalized ahead of the spring 2005 sampling period. **(3)** Crayfish surveys will be conducted between March and May 2005 and again between September and November 2005 at the ten proposed Park Service properties. Each unit will be visited at least once. **(4)** Identification of collected specimens will begin during the summer and late fall of 2005.

Objective 4 – Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program and conduct quality assurance and review of all inventory products.

Task 4.1 – Complete vegetation sampling, classification and mapping for FRSP, RICH, BOWA, PETE, APCO

- **FY 2004 Accomplishments**: **(1)** Virginia Division of Natural Heritage (VDNH) ecologists entered data collected during the 2003 field season into plots databases; completed edits to the photo interpretation line work for BOWA and tagged all polygons to units in the United States National Vegetation Classification; continued or completed vegetation sampling and qualitative evaluation of mapping line work in APCO, PETE, RICH, and FRSP. Twenty-eight additional quantitative plots were sampled and an additional 331 observation points were collected; and added an amendment to the core agreement that provides for additional funding and an extension of the project until December 2007. **(2)** The Center for Earth Observation of North Carolina State University (NCSU), created metadata for the PETE, RICH, BOWA, APCO, and FRSP mosaics that were produced in 2003, and distributed copies of these data as requested.

- **Scheduled FY 2005 Activities and Products**: **(1)** VDNH ecologists will present a progress report to the Philadelphia Support Office in December 2004. Data collected in 2004 will be entered into the NatureServe PLOTS database. Editing of the photo interpretation line work for APCO will be completed and editing will begin for FRSP vegetation line work. Polygons will be attributed with vegetation classifications where possible. Local vegetation descriptions will be completed for BOWA and APCO and a key to the APCO vegetation will be developed for use in the map Accuracy Assessment. From May 2005 to October 2005: An accuracy assessment for the draft vegetation map of APCO will be completed. Vegetation sampling and polygon assessment will be completed in RICH and PETE and any fieldwork needed to fill data gaps in FRSP will be conducted. **(2)** NCSU will prepare and submit final spatial data products and distribute final data CDs/DVDs for the PETE, RICH, BOWA, APCO, and FRSP vegetation maps.

Task 4.2 – Complete vegetation sampling, classification and mapping for HOFU, VAFO

- **FY2004 Accomplishments**: **(1)** The Pennsylvania Science Office (PSO) of the Nature Conservancy, PA Natural Diversity Inventory (PANDI) conducted vegetation mapping at VAFO and HOFU. Revisions were begun in spring of 2004 using remnant funds from the original work scopes for HOFU and VAFO and were suspended when funds were exhausted and the onset of the field season. **(2)** In July 2004, NCSU completed a review of the spatial data that are part of the HOFU vegetation mapping products and submitted a review report to the Regional Coordinator, Chief Scientist and Dr. Greg Podniesinski (The Nature Conservancy). **(3)** Based on the review of the HOFU and VAFO vegetation mapping data, NCSU developed the proposed standardized procedures for reviewing I&M vegetation map data and metadata. These procedures are described in a report titled, "QA/QC Procedures for Vegetation Mapping Products."
- **FY 2005 Scheduled activities and products**: **(1)** PANDI will complete final revisions to vegetation mapping reports and other products for both parks by November 30, 2004, and submit to NPS. **(2)** NCSU will complete the review of VAFO vegetation mapping data, including the orthophoto mosaic, accuracy assessment shapefile, PLOTS database, and plots shapefile; revise the review report as needed, finalize, and submit; and, request appropriate NPS staff to review the report, "QA/QC Procedures for Vegetation Mapping Products," and revise it as needed. The report is expected to be finalized by December 31, 2004.

Task 4.3 – Complete vegetation sampling, classification and mapping for GETT and EISE

- **FY 2004 Accomplishments**: **(1)** The Pennsylvania Science Office (PSO) of the Nature Conservancy, PA Natural Diversity Inventory (PANDI) conducted vegetation mapping at GETT and EISE. **(2)** NCSU's Center for Earth Observation, created digital orthophoto mosaics for GETT and EISE, assessed positional accuracy of the mosaics, created metadata for each mosaic, and formatted and distributed the mosaics and metadata to PANDI. **(3)** A preliminary formation-level vegetation map was developed by PANDI using the digital photomosaic, original aerial photography, and field reconnaissance. **(4)** Vegetation classification sampling was completed during the 2004 field season, with a total of 70 plots sampled and qualitative observations made on approximately 90% of all formation-level polygons. **(5)** Vegetation classification data entry has been completed.
- **Scheduled FY 2005 Activities and Products**: **(1)** PANDI will conduct analysis of vegetation classification plot data completed by late winter 2004-2005, and develop an alliance-level vegetation map, alliance-level vegetation descriptions and key, and perform accuracy assessment sampling. **(2)** NCSU will prepare and submit final reports and distribute final data CDs/DVDs for the GETT and EISE mosaics.

Task 4.4 Assist in the development of standards for vegetation map review and assessment (All parks)

- **FY 2004 Accomplishments**: **(1)** Vegetation mapping is underway in all network parks and products are being delivered. Based on the first two vegetation maps from VAFO and HOFU, NCSU has completed a review of spatial data and submitted a report to the Regional Coordinator, Chief Scientist and Dr. Greg Podniesinski (The Nature Conservancy). (**2)** Based on the review of the HOFU and VAFO vegetation mapping data, NCSU developed the proposed standardized procedures for reviewing I&M vegetation map data and metadata. These procedures are described in a report titled, "QA/QC Procedures for Vegetation Mapping Products."
- **Scheduled FY 2005 Activities and Products**: The map review and assessment standards will continue to be used as mapping products are completed for the MIDN.

Task 4.5 Inventory Paleontological Resources (All Parks)

- **FY 2004 Accomplishments:** The planned paleontological inventory for MIDN was not conducted due to time and funding constraints.
- **Scheduled FY 2005 Activities and Products:** The inventory of paleontological resources will be completed for network parks by Vincent Santucci with support from Geologic Resources Division.

Task 4.6 Inventory Air Quality Resources (All Parks)

- **FY 2004 Accomplishments:** Tonnie Maniero from Air Resources Division completed the air quality considerations report for the MIDN. The report outlines the existing federal and non-federal air quality monitoring programs and locations of monitors.
- **Scheduled FY 2005 Activities and Products:** No further activities are planned for the coming year.

Task 4.7 Inventory Geological Resources (All Parks)

- **FY 2004 Accomplishments:** A scoping meeting was conducted by Bruce Heise, Geological Resources Division (GRD) for parks in Pennsylvania, including the four MIDN parks, EISE, GETT, HOFU, and VAFO as part of the Geologic Resources Evaluation. In collaboration with USGS staff, current geologic maps and resources were evaluated.
- **Scheduled FY 2005 Activities and Products:** GRD will conduct a scoping meeting for the Virginia parks of MIDN.

B. Vital Signs Monitoring

Objective 5-Hire and retain professional staff and provide a safe, healthy, and productive work environment.

Task 5.1 – Hire Network Coordinator and Data Manager
Parks Involved: ALL

- **FY 2004 Accomplishments: (1)** A MIDN Network Coordinator position was re-advertised and closed in January 2004. Three candidates were selected from the certificate of eligibles, and interviews were conducted during March 2004. Interview panel included the Regional Coordinator, three NER Network coordinators, FRSP Chief Ranger, and VAFO Superintendent. The Network Coordinator was selected and started April 26, 2004. **(2)** A Cooperative Agreement with North Carolina State provided data management support in the absence of a network Data Manager. The Board of Directors determined that hiring the network data manager should be postponed until 2005 when data management needs would be greatest and the future funding of MIDN would be clearer.

- **Scheduled FY 2005 Activities and Products: (1)** The Data Manager position will be advertised in January 2005. In the interim, data management needs will continue to be accomplished through the cooperative agreement with NCSU. **(2)** Full funding for the network will not occur in 2005 and when funded in a later fiscal year it will increase to just $301,000.

OBJECTIVE 6 - Develop and maintain working and decision-making processes that engage the Board of Directors, Science Advisory Committee, technical staff, and managers of Network parks.

Task 6.1 – Board of Directors and Network Charter
Parks Involved: ALL

- **FY2004 Accomplishments: (1)** A network Board of Directors meeting was held via conference call in January 2004 to review 2003 progress, discuss hiring and approve the FY 2004 work plan. **(2)** The BOD established Russ Smith, Superintendent FRSP as signatory for the Board.
- **Scheduled FY 2005 Activities and Products: (1)** Board of Directors to meet in November or December to review 2004 progress, discuss hiring and funding, and approve FY 2005 work plan. **(2)** Network Coordinator to be added to the Network Charter as the Point of Contact for NPSpecies.

Task 6.2 – Science Advisory Committee
Parks Involved: ALL

- **FY2004 Accomplishments: (1)** In 2003, network resource managers nominated Science Advisory Committee members. RICH park resource manager Kristen Allen contacted nominees to seek participation. Network Coordinator has been contacting nominees and evaluating other potential candidates for the SAC. The committee has not been formed as yet.
- **Scheduled FY 2005 Activities and Products: (1)** Park superintendents, resource managers, resource specialists and site managers for parks, as well as the regional chief scientist and regional I&M coordinator, will establish a Science Advisory Committee. **(2)** The Science Advisory Committee will meet once to learn about the vital signs program and assist with developing meetings will be held to prepare material needed for scoping sessions.

Task 6.3 – Site Visits with Natural Resource Staff
Parks Involved: ALL

- **FY2004 Accomplishments: (1)** Network Coordinator conducted site visits to all parks in MIDN to gather information for the Phase I report including park natural resource issues and threats, current projects, and potential vital signs. **(2)** Carolyn Davis, NNL Coordinator, is currently assisting the network. **(3)** Each park has provided information including a resource management plan, a strategic plan, a general management plan and other planning documents that help identify goals and objectives for natural resource management.
- **Scheduled FY 2005 Activities and Products: (1)** The network will complete park profiles that will provide an overview of the park, legislation and mandates, natural resources, management issues, and monitoring programs. This review will highlight natural resource issues that are important to each network park and will require review by park resource staff. **(2)** Additional site visits and consultation with Natural Resource staff will be conducted by the Network Coordinator and assistant as needed.

Task 6.4 – Develop Web Page for the Network

- **FY2004 Accomplishments:** An existing cooperative agreement between NCBN and the Environmental Data Center (EDC) at the University of Rhode Island was amended to develop a

Webpage for the MIDN and for SHEN I&M prototype program. These sites were created to act as multi-functioning resources for both the public and Park Service staff, and contain general overviews and summaries of the network's various inventory and monitoring programs and initiatives, present photo galleries of park natural resources, and serve as clearinghouses for the distribution of scientific data and reports.

- **Scheduled FY 2004 Activities and Products: (1)** The MIDN website will be maintained by the Network Coordinator until the Data Manager is hired. **(2)** The site will be populated with reports and program updates on a regular basis. **(3)** URI cooperators will continue to provide maintenance as requested.

Task 6.5 - Contribute to General Management Planning

- **FY2004 Accomplishments**: **(1)** VAFO GMP process continues to be augmented by I&M data. **(2)** Network Coordinator is working with VAFO staff to provide scientific support for the vegetation management plan.
- **Scheduled FY 2005 Activities and Products:** Northeast Region I&M staff will continue to assist park resource managers as information becomes available to identify and review existing natural resource studies and data sets for network parks; analyze, consolidate and synthesize this information to identify the natural resource characteristics and conditions in the context of each park's purpose and mission; identify issues and opportunities that should be addressed during the GMP process; identify critical gaps in the knowledge base which must be addressed prior to initiating the planning process; identify usable natural resource data to better inform the GMP process; present the results of this work to park planners and managers in a way that is understandable and useable in the park planning and management process(s); and identify a cadre of knowledgeable natural resource professionals that would continue in an advisory role during each park's planning process.

OBJECTIVE 7 - Develop, implement, and maintain a Network data management program. (Note: this objective is placed under Vital Signs monitoring, however, it is equally important and integrated with the Biological Inventories portion of the program.).

Task 7.1 – GIS and Data Management Assistance

- **FY 2004 Accomplishments:** As part of the cooperative agreement with NC State for data management assistance in the Northeast Region Inventory and Monitoring (I&M) Program, NCSU work with cooperators and contractors to assure that natural resource inventory data are georeferenced according to national standards and are spatially consistent with GIS data for the corresponding park(s). Specifically, for the vertebrate inventories in EISE, GETT, HOFU, and VAFO they: **(1)** Verified that vector data contained in the shapefiles submitted for the project line up with existing park GIS data; **(2)** reviewed tabular data for completeness and internal consistency and assisted with soliciting any missing information; **(3)** verified that complete, FGDC compliant metadata exists and created biological metadata for each dataset; **(4)** constructed Microsoft Word formatted data dictionaries for each dataset; **(5)** reviewed orthophotos created by others and creating digital orthophoto mosaics for the VA parks and GETT and EISE; and **(6)** developed vegetation map data review procedures. In addition, NCSU provided support to all MIDN parks and the Network Coordinator with GIS and data management, and will compile and distribute base GIS data for the network – scheduled for FY2006.
- **Scheduled FY 2005 Activities and Products: (1)** NC State will continue to provide research support to biological inventory projects in the MIDN and the region, that will include: Verifying that each scientist is working with the appropriate GIS base data; Reviewing tabular data from each project for compatibility with the national data structure following the Natural Resource Database

Template and assisting with soliciting any missing information; Assisting each scientist to assure that all information necessary for completing fully compliant metadata is available and taking a lead role in constructing metadata records; and constructing the appropriate NPS Dataset Catalog records and Microsoft Word formatted data dictionaries for each project**. (2)** NC State will develop distribution procedures and distribute base GIS data for the MIDN in FY2006. At a minimum, base GIS data will include the following layers, in their latest and highest available resolution, with FGDC compliant metadata: 1. Park Boundary, 2. Digital Ortho Quarter Quadrangles (DOQQ's) in MrSID format, 3. Digital Elevation Models (DEM's), 4. Digital Raster Graphics (DRG's) in MrSID format, 5. All available vector base data (roads, trails, hydro, contours, facilities, shorelines, etc.).

Task7.2-Relational database development for park inventories

- **FY 2004 Accomplishments**: NCSU converted existing inventory data to relational access databases and assisted cooperators in developing FGDC compliant metadata following the biological profile. **(2)** Provided assistance to parks as needed in developing data entry forms for park inventories.
- **Scheduled FY 2005 Activities and Products: (1)** Continue to locate any significant data sources and convert existing inventory data to relational access databases. **(2)** Provide Access databases to parks as needed.

Task 7.3-Archive data sets and reports

- **FY 2004 Accomplishments**: North Carolina State University **(1)** developed, refined, and implemented procedures for cataloging and archiving I&M data. **(2)** Since January 2004, archived the digital orthophoto mosaics that they created or reviewed for the NER I&M Program. **(3)** Started to develop an online data delivery service using Oracle, ArcSDE, and ArcIMS.
- **Scheduled FY 2005 Activities and Products:** NC State will **(1)** continue to catalog and archive NER I&M Program data as they are received, and **(2)** implement an online data delivery service that is currently under development.

OBJECTIVE 8 -Summarize existing data, identify, and prioritize all indicators, then develop protocols and implement programs to monitor the Vital Signs.

Task 8.1-Summarize Existing Data and Identify Potential Indicators.

- **FY 2004 Accomplishments: (1)** The Network Coordinator held informal and formal meetings with Park resources managers and cooperators involved with natural resource management within network parks. **(2)** Carolyn Davis, National Natural Landscapes Coordinator, is assisting the network to summarize enabling legislation, existing monitoring programs, important natural resources, and ecologically significant "stressors" that have the potential to impact natural resources within network parks. **(3)** The Coordinator is compiling additional information on existing and historic monitoring inside and outside the park boundaries of relevance to the network.
- **Scheduled FY 2005 Activities and Products: (1)** Continue to gather information and evaluate important natural resource issues at network parks by meeting with park resource managers, cooperators and other stakeholders. Complete a draft park profile report by January 2005. **(2)** Compile a list of potential indicators that can be used for the network monitoring program by May 2005. **(3)** Complete existing data compilation on monitoring by NPS and others. **(4)** Have the various reports on existing data reviewed prior to submission for Phase I report in October 2005.

Task 8.2-Develop Conceptual Models for Important Ecosystems.

- **Scheduled FY 2005 Activities and Products: (1)** Develop conceptual models for network ecosystems, identify relationships between potential indicators, stressors and agents of change. **(2)** Work with Park Staff and Science Advisory Committee to elicit and attain a cooperator to develop conceptual models for important ecosystems.

Task 8.3- Evaluate grassland and shrubland bird communities in cultural landscapes and develop a monitoring framework.

- **FY 2004 Accomplishments:** Through a cooperative agreement with the Patuxent Wildlife Research Center, USGS, a study was initiated to develop a sampling design to evaluate the long-term contribution of cultural parks to the conservation of grassland and shrubland birds, focusing primarily on the Mid-Atlantic Network (MIDN), the Eastern Rivers and Mountains Network (ERMN), and the National Capital Region Network (NCRN). The project aims to **(1)** evaluate grassland and shrubland habitats in NPS units of the MIDN, ERMN, and NCRN; **(2)** examine the potential for monitoring breeding grassland and shrubland bird communities as an indicator for cultural landscape integrity and habitat quality; **(3)** identify the potential of these parks to support significant breeding grassland and shrubland bird communities, and provide recommendations concerning management activities that could enhance habitat availability for these bird communities; and **(4)** for parks supporting significant bird communities, design and establish a multi-regional grassland and shrubland bird monitoring framework to detect trends in populations that could be implemented on federal and adjacent non-federal lands. During this fiscal year, site visits were conducted to all parks where pilot projects will be implemented, including Gettysburg National Military Park from the MIDN, Antietam National Battlefield and Manassas National Battlefield from the NCRN, and Fort Necessity National Battlefield from the ERMN. As a result of the visits, a questionnaire has been developed that will be sent to the remaining parks in the three networks to help compile information for objective 1.
- **Scheduled FY 2005 Activities and Products: (1)** October 2004 to January 2005. Send out questionnaire to all parks in the three networks to compile information on the extent of grassland and shrubland habitats in the park units. **(2)** Evaluate abundance and distribution of suitable habitat and draft appropriate monitoring questions. **(3)** By April 2005, develop a draft monitoring protocol for testing in the pilot parks, including GETT in MIDN. By October 2005, complete pilot testing at the four pilot parks.

OBJECTIVE 9 - Integrate water quality monitoring in the Network Vital Signs monitoring plan.

Task 9.1-Summarize existing data.

- **Scheduled FY 2005 Activities and Products:** As part of the vital signs program development, we will seek expertise to **(1)** compile information on state-identified "impaired" (305b and 303d-listed) waters within network parks, **(2)** compile information on state-identified outstanding waters, or special protection waters, **(3)** compile information on other water bodies in the network not officially recognized as such, but that are thought to be both pristine and ecologically highly significant at the park or Network scale, and **(4)** identify ecologically significant "stressors" that have the potential to impact water quality within network parks.

Task 9.2- Identify and acquire published resources on water quality monitoring

- **Scheduled FY 2005 Activities and Products: (1)** Review work of other networks in integrating water quality into vital signs.

Task 9.3-Technical Evaluation of existing Water Quality Monitoring Programs

- **Scheduled FY 2005 Activities and Products:** Work with Park Staff and Science Advisory Committee and seek a cooperator to do the following: **(1)** data mining and database review activities to determine the status of active and historic water quality monitoring within the parks of MIDN, **(2)** begin compiling existing water quality data, and begin an analysis of the adequacy of current monitoring (by NPS or others), **(3)** evaluate existing water quality monitoring programs (NPS or other).

III. Staffing

Inventory and Monitoring Staff
John Karish, Chief Scientist
Elizabeth Johnson, Northeast Region I&M Coordinator
Jim Comiskey, Mid-Atlantic Network Coordinator
Jennifer Keefer, Research Associate, PSU
Scott Tiffney, Research Associate, PSU
Sara Stevens, Northeast Coastal and Barrier Network Data Manager
Carolyn Davis, NNL Program Coordinator

Mid-Atlantic Network Cooperators
Frostburg State University – Dr. Ron Barry
Virginia Commonwealth University – Dr. John Pagels
College of William and Mary, Center for Conservation Biology – Dr. Dana Bradshaw
University of Richmond – Dr. Joe Mitchell
West Chester University – Dr. Harry Tiebout III
Dr. James Atkinson and the SHEN fish crew
Alan Williams (fish data management)
North Carolina State University, Field Technical Support Center – Dr. Hugh Devine
NatureServe – Lesley Sneddon
VA Department of Natural Resources (Heritage program) – Chris Ludwig and Karen Patterson
PA Natural Diversity Inventory (Natural Heritage Program) – Greg Podniesinski and Stephanie Perles
PA Natural Diversity Inventory (Natural Heritage Program) – Jim Hart
University of Rhode Island, Environmental Data Center – Dennis Skidds
Tonnie Maniero – NPS ARD
Vincent Santucci – NPS
Penn State University – Dr. Richard Yahner and Brad Ross
Penn State University – Dr. Jay Stauffer and Tim Stecko
Penn State University – Dr. Bob Carline and Dave Lieb
USGS, Patuxent Wildlife Research Center – Dr. Bruce Peterjohn

IV. Reports, Publications and Presentations

Reports
Atkinson, James B. 2003. Fish Inventories of Mid-Atlantic and Northeast Coastal and Barrier Network Parks within Virginia, Maryland and Pennsylvania. 2003 Annual Report. Natural Resources Branch; Division of Natural and Cultural Resources; Shenandoah National Park. 43 p.

Barry, Ron. E. 2004. Mammal Surveys at George Washington Birthplace National Monument, Thomas Stone National Historic Site, Colonial National Historical Park, Richmond National Battlefield Park, and Fredericksburg and Spotsylvania County Memorial National Military Park.

Progress Report for Cooperative Agreement No. 1443DCA309701200, Task Order No. T-3097-01-300 of the Chesapeake Watershed Cooperative Ecosystem Studies Unit.

Devine, Hugh A. 2003. Preliminary Development of a Natural Resource Database to Support General Management Planning at Valley Forge National Historical Park, Final Report. Raleigh, NC.

Devine, Hugh A. 2004. Geospatial Vegetation Data Development for Selected National Parks, Annual Report for the Period January 1, 2003 through March 11, 2004. Raleigh, NC.

Devine, Hugh A. and Kristina Callahan. 2004. Spatial Data Review for Vegetation Mapping Products, Hopewell Furnace National Historic Site. Raleigh, NC.

Devine, Hugh A. and Kristina Callahan. 2004. Spatial Data Review for Vegetation Mapping Products, Valley Forge National Historical Park. Raleigh, NC.

Manniero, Tonnie. 2004. Air quality considerations for the Mid-Atlantic Network. National Park Service, Northeast Region, Air Quality Division.

Podniesinski, G., S. Perles, L. Sneddon, and B. Millinor. 2003. NPS vegetation mapping program: Final draft report of the vegetation classification and mapping of Hopewell Furnace National Historic Site. The Nature Conservancy, NatureServe (formerly the Association for Biodiversity Information) and North Carolina State University Center for Earth Observations.

Publications
None

Presentations

Dolbeare, T., H. Warchalowski, D. Strang, A. Sareen, C. Tanner, J. Mulligan, and R. Barry. 2004. Surveys of the mammals of national parks in Maryland and Virginia. Poster presentation. Northeast Fish and Wildlife Conference 60th annual meeting, Ocean City, Maryland.

Sareen, A., J. M. Mulligan, C. L. Tanner, and R. E. Barry. 2004. Inventories of the mammals of national parks in the Piedmont (mid-Atlantic) region of Virginia. Poster presentation. American Society of Mammalogists 84th annual meeting, Humboldt State University, Arcata, California.

Sareen, A., T. Dolbeare, D. Strang, H. Warchalowski, and R. Barry. 2003. Surveys of mammals of national parks in Virginia and Maryland. Poster presentation. Student Research Day, Frostburg State University, Frostburg, Maryland.

Callahan, Kristina. 2003. Database Template as a Geodatabase in ArcGIS. Presentation at the NPS Northeast Region GIS Workshop, December 15-16, 2003, Philadelphia, PA.

Callahan, Kristina. 2004. Integrating ArcGIS with MS Access: Database Template as a Geodatabase. Presentation at NPS ArcGIS Developer's Meeting, February 18-19, 2004, Fort Collins, CO.

Callahan, Kristina. 2004. NRDT as a Geodatabase and an ArcGIS Tool to Display NRDT Data. Presentation at NPS National Data Manager's Meeting, April 5-8, 2004, Las Vegas, NV.

Colson, Thomas. 2004. Integrating ArcGIS with MS Access: Integrating Multiple Data Sources with ArcGIS. Presentation at NPS ArcGIS Developer's Meeting, February 18-19, 2004, Fort Collins, CO.

Devine, Hugh A. 2003. Integrated GIS Data Model. Presentation at the NPS Spatial Odyssey Conference, December 2003, Orlando, FL.

Johnson, Elizabeth. 2004. MIDN Board of Directors Meeting. Conference call with PowerPoint presentation. January 2004.

Millinor, William A. 2003. Vegetation Mapping for the National Park Service Using Softcopy Photogrammetry. Presentation at the NPS Northeast Region GIS Workshop, December 15-16, 2003, Philadelphia, PA.

Websites

Mid-Atlantic Network Inventory and Monitoring Program.
http://www.nature.nps.gov/im/units/midn/

Shenandoah National Park Natural Resource Inventory and Monitoring Programs.
http://www.nps.gov/shen/SHEN_IM/inventory.htm
http://pawcatuck.edc.uri.edu/SHEN_IM/monitoring.htm

V. Status of Park Vital Signs Monitoring

Since this network includes SHEN, a prototype park, one of the 10 parks in the network has identified vital signs. The other 9 parks are in the very early stages of planning a park vital signs monitoring program, and are considering all 7 monitoring categories, but have not yet made decisions and prioritized what components they will monitor. Several parks are already doing some monitoring using funds from park base and partnerships and other sources as reflected in the "protocols implemented" and "analysis/synthesis available" sections.

Mid-Atlantic Network 2004	Air Quality	Water Quality	Water Quantity	Geologic Resources	Plants	Animals	Landscape Characteristics
Planning and Design							
# parks monitoring w/ NRC funding	10	10	10	10	10	10	10
# parks monitoring w/ other funding	1	3	1	1	4	10	0
Protocols Implemented							
# parks monitoring w/ NRC funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	1	3	1	1	4	10	0
Analysis/Synthesis Available							
# parks monitoring w/ NRC funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	1	3	1	1	4	10	0

Note: Air (SHEN), Water Quality (SHEN, VAFO, HOFU) Water quantity (SHEN), Geologic Resources (SHEN), Plants (SHEN, VAFO, GETT, EISE), Animals (All).

VI. USGS Protocol Development and Monitoring-Related Research Needs

The Mid-Atlantic Network can use assistance from USGS in

- Review of vegetation mapping products.
- Developing conceptual models to assist in identifying vital signs for each park and for the network.
- Monitoring planning and design and spatial sampling design in FY2005-6.
- Developing quantitative models of ecosystem health from vegetation mapping products.

VII. Budget

In FY2004, the MIDN received $506,394 in funding, including inventory ($176,800), monitoring ($150,000) and vegetation mapping ($136,100) funds. All funds were subject to the 2% regional assessment. In FY 2004, MIDN reimbursed the Northeast Coastal and Barrier Network (NCBN) $86,212 in funds that were "borrowed" in FY 2002 to get the network biological inventories underway. Of the inventory funds, $80,200 was allocated for the APPA, and used by the Northeast Temperate Network (NETN). The Eastern Rivers and Mountains Network also reimbursed MIDN for funds borrowed in 2003, and these were used to cover a new cooperative agreement with USGS and part of an agreement with Penn State University. Of the vegetation funds, $81,075 was provided to MIDN to cover the cost for a regional I&M data archive, beginning with vegetation mapping products, through North Carolina State University, and benefiting all networks in the region. Monitoring funds were used for personnel, office expenses, equipment and supplies, travel, web page development, data management, and biotic inventories.

We anticipate the authorization of $225,000 for vital signs monitoring and $44,000 for water quality monitoring in FY2005. These funds will be used for personnel, one-time purchases of computer equipment, travel and support for the office at FRSP. Additional support for data management will be provided by North Carolina State University while we are hiring the Data Manager in early spring, and for support in data archiving. MIDN will continue to receive assistance from Pennsylvania State University in compiling bibliographic citations in NatureBib, and from the University of Rhode Island in maintaining the network web page. With SHEN, we are looking to support the Virginia Museum of Natural History as a central repository of natural history collections for the network. We will fund an amendment to an existing inventory contract with Frostburg State University to cover additional housing expenses during the course of the 2004 field season. In addition, we will also seek cooperators to help in developing products for the Phase I report, including water quality scoping for each of the parks.

A summary of our FY2004 expenditures and FY2005 budget plans is provided on the following pages.

Budget Summary

FY04 Admin Report Network: 30 Mid-Atlantic

Category: 1_Income

Description	$ Amount	$$ Source	Where $ Went	Comments
MIDN Vegetation mapping	$136,100.00	Veg. Mapping Program		Includes $81,075 for NER vegetation mapping data archiving
1/4 Regional Coord. 2144-NII account	$30,000.00	I&M - VS Monitoring $$		
MIDN Monitoring	$150,000.00	I&M - VS Monitoring $$		
MIDN Inventory	$96,600.00	I&M - Biol. Inventory $$		
APPA Inventory	$80,200.00	I&M - Biol. Inventory $$		Funds expended by NETN and reported in their AARWP
ERMN Monitoring payback	$13,494.00	Other Partners		Repayment from ERMN for inventories conducted in 2003 paid by MIDN
Subtotal	*$506,394.00*			

Category: 2_Personnel

Description	$ Amount	$$ Source	Where $ Went	Comments
Regional Coordinator 2144-NII	$25,500.00	I&M - VS Monitoring $$	NPS	
Network Coordinator	$38,598.29	I&M - VS Monitoring $$	NPS	
Subtotal	*$64,098.29*			

Category: 3_Coop. Agreements

Description	$ Amount	$$ Source	Where $ Went	Comments
USGS - PWRC - Grassland birds	$11,825.00	Other Partners	Other Federal	ERMN repay MIDN for inventories in 2003
VA DNH - Vegetation mapping VA parks	$29,600.00	Veg. Mapping Program	Other non-Federal	
NC State Vegetation mosaics for VA parks	$12,572.00	Veg. Mapping Program	Univ_Non-CESU	
University of RI - Web page development	$6,294.00	I&M - VS Monitoring $$	Univ_Non-CESU	
NCState - data management	$7,750.00	I&M - VS Monitoring $$	Univ_Non-CESU	
Penn Statue University - NatureBib	$3,543.00	I&M - VS Monitoring $$	Univ_Non-CESU	
Virginia Commonwealth U - Mammals	$5,175.00	I&M - Biol. Inventory $$	Univ_Non-CESU	
NCState - Vegetation mapping	$81,075.00	Veg. Mapping Program	Univ_Non-CESU	Funds provided to MIDN to support Veg mapping data archiving for all NER networks
Nature Conservancy - PANDI - Bat inventory	$36,948.00	I&M - VS Monitoring $$	Other non-Federal	
Research Foundation of State	$16,333.40	I&M - Biol. Inventory $$	Other non-Federal	NETN Inventory funds for APPA

Penn Statue University - NatureBib	$1,669.00	Other Partners	Univ_Non-CESU	ERMN repay MIDN for inventories in 2003
Penn State University - Crayfish inventory	$10,000.00	I&M - VS Monitoring $$	Univ_Non-CESU	
NC State Data archival	$2,500.00	I&M - VS Monitoring $$	Univ_Non-CESU	
Nature Conservancy - PANDI - Veg mapping	$10,153.00	Veg. Mapping Program	Other non-Federal	
University of RI	$85,962.00	I&M - Biol. Inventory $$	Univ_Non-CESU	Repay NCBN for MIDN inventories in 2002
East Stroudsburg University	$62,262.00	I&M - Biol. Inventory $$	Univ_Non-CESU	NETN Inventory funds for APPA
NCState - data management NCBN	$250.00	I&M - Biol. Inventory $$	Univ_Non-CESU	Repay NCBN for MIDN inventories in 2002
Subtotal	*$383,911.40*			

Category: 4_Contracts

Description	$ Amount	$$ Source	Where $ Went	Comments
PCS Move	$21,515.00	I&M - VS Monitoring $$	Other non-Federal	Funds obligated
Subtotal	*$21,515.00*			

Category: 5_Operations/Equipme

Description	$ Amount	$$ Source	Where $ Went	Comments
Supplies and Equipment	$6,307.68	I&M - VS Monitoring $$	Other non-Federal	
FRSP Office - utilities, communications, internet	$8,043.22	I&M - VS Monitoring $$	Other non-Federal	
Subtotal	*$14,350.90*			

Category: 6_Travel

Description	$ Amount	$$ Source	Where $ Went	Comments
Network Coordinator PCS Move	$3,537.00	I&M - VS Monitoring $$	NPS	Funds obligated
Training and Travel	$5,863.81	I&M - VS Monitoring $$	Other non-Federal	
SHEN Fish Crew - Fish inventory	$3,129.60	I&M - Biol. Inventory $$	Other non-Federal	
Subtotal	*$12,530.41*			

Category: 7_Other

Description	$ Amount	$$ Source	Where $ Went	Comments
Regional Assessment (2%)	$3,000.00	I&M - VS Monitoring $$	NPS	
Regional Assessment (2%) MIDN	$2,084.00	I&M - Biol. Inventory $$	NPS	
Regional Assessment (2%) ATTA	$1,604.00	I&M - Biol. Inventory $$	NPS	
Regional Assessment (2%)	$2,700.00	Veg. Mapping Program	NPS	
Regional Assessment (2%) Regional Coord 2114-NII Account	$600.00	I&M - VS Monitoring $$	NPS	
Subtotal	*$9,988.00*			

Budget Analysis

Analysis of Expenses by Where $ Went

Funding Source	Total $$	NPS	USGS	Other Federal	Univ.-CESU	Univ_Non-CESU	Other non-Federal
I&M - Biol. Inventory $$	$176,800	$3,688				$153,649	$19,463
I&M - VS Monitoring $$	$180,000	$71,235				$30,087	$78,678
Other Partners	$13,494			$11,825		$1,669	
Veg. Mapping Program	$136,100	$2,700				$93,647	$39,753
Totals	$506,394	$77,623		$11,825		$279,052	$137,894

Analysis of Expenses by Category

Funding Source	Total $$	Personnel	Coop Agree.	Contracts	Operations/Equip.	Travel	Other
I&M - Biol. Inventory $$	$176,800		$169,982			$3,130	$3,688
I&M - VS Monitoring $$	$180,000	$64,098	$67,035	$21,515	$14,351	$9,401	$3,600
Other Partners	$13,494		$13,494				
Veg. Mapping Program	$136,100		$133,400				$2,700
Totals	$506,394	$64,098	$383,911	$21,515	$14,351	$12,530	$9,988

Expense Totals By Category

Category	SubTotal	Percent
2_Personnel	$64,098	12.66%
3_Coop. Agreements	$383,911	75.81%
4_Contracts	$21,515	4.25%
5_Operations/Equipment	$14,351	2.83%
6_Travel	$12,530	2.47%
7_Other	$9,988	1.97%
	$506,394	

Budget Summary

FY05 Work Plan Network: 30 Mid-Atlantic

Category: 1_Income

Description	$ Amount	$$ Source	Where $ Went	Comments
Water Quality	$44,000.00	WRD - WQ Monitoring		
MIDN Monitoring	$225,000.00	I&M - VS Monitoring $$		
1/4 Regional Coordinator account 2144-NII	$30,000.00	I&M - VS Monitoring $$		
Subtotal	*$299,000.00*			

Category: 2_Personnel

Description	$ Amount	$$ Source	Where $ Went	Comments
Network coordinator	$98,000.00	I&M - VS Monitoring $$	NPS	
Data Manager	$40,000.00	I&M - VS Monitoring $$	NPS	
1/4 Regional Coordinator account 2144-NII	$27,400.00	I&M - VS Monitoring $$	NPS	
Subtotal	*$165,400.00*			

Category: 3_Coop. Agreements

Description	$ Amount	$$ Source	Where $ Went	Comments
Frostburg State University - Mammals	$6,000.00	I&M - VS Monitoring $$	Other non-Federal	
NCSU data archiving	$16,000.00	I&M - VS Monitoring $$	Univ_Non-CESU	
NCSU Data management support	$11,000.00	I&M - VS Monitoring $$	Univ_Non-CESU	
VA Museum of Natural History	$7,000.00	I&M - VS Monitoring $$	Univ_Non-CESU	
Web page support - URI	$3,500.00	I&M - VS Monitoring $$	Univ_Non-CESU	
Water Quality Report	$43,200.00	WRD - WQ Monitoring	Univ_Non-CESU	
Naturbib - PSU	$3,000.00	I&M - VS Monitoring $$	Univ_Non-CESU	
Subtotal	*$89,700.00*			

Category: 5_Operations/Equipme

Description	$ Amount	$$ Source	Where $ Went	Comments
Equipment and supplies	$10,000.00	I&M - VS Monitoring $$	Other non-Federal	
FRSP Office - Utilities, communications, internet	$10,000.00	I&M - VS Monitoring $$	Other non-Federal	
Subtotal	*$20,000.00*			

Category: 6_Travel

Description	$ Amount	$$ Source	Where $ Went	Comments
Data Manager PCS Move	$6,000.00	I&M - VS Monitoring $$	Univ_Non-CESU	
MIDN network travel	$10,000.00	I&M - VS Monitoring $$	Other Federal	
1/4 Regional Coordinator account 2144-NII	$2,000.00	I&M - VS Monitoring $$	Other non-Federal	
Subtotal	*$18,000.00*			

Category: 7_Other

Description	$ Amount	$$ Source	Where $ Went	Comments
Regional assessment (2%)	$800.00	WRD - WQ Monitoring	NPS	
Regional assessment (2%)	$4,500.00	I&M - VS Monitoring $$	NPS	
Regional assessment account 2144-NII (2%)	$600.00	I&M - VS Monitoring $$	NPS	
Subtotal	*$5,900.00*			

Budget Analysis

Analysis of Expenses by Where $ Went

Funding Source	Total $$	NPS	USGS	Other Federal	Univ.-CESU	Univ_Non-CESU	Other non-Federal
I&M - VS Monitoring $$	$255,000	$170,500		$10,000		$46,500	$28,000
WRD - WQ Monitoring	$44,000	$800				$43,200	
Totals	$299,000	$171,300		$10,000		$89,700	$28,000

Analysis of Expenses by Category

Funding Source	Total $$	Personnel	Coop Agree.	Contracts	Operations/Equip.	Travel	Other
I&M - VS Monitoring $$	$255,000	$165,400	$46,500		$20,000	$18,000	$5,100
WRD - WQ Monitoring	$44,000		$43,200				$800
Totals	$299,000	$165,400	$89,700		$20,000	$18,000	$5,900

Expense Totals By Category

Category	SubTotal	Percent
2_Personnel	$165,400	55.32%
3_Coop. Agreements	$89,700	30.00%
5_Operations/Equipment	$20,000	6.69%
6_Travel	$18,000	6.02%
7_Other	$5,900	1.97%
	$299,000	

Appendix 1: Summary of Major Accomplishments

Mid-Atlantic Network – The Mid-Atlantic Network (MIDN) is comprised of 10 parks located in Pennsylvania and Virginia: Shenandoah NP (SHEN) (a Prototype Park), Booker T. Washington NHS (BOWA), Richmond National Battlefield Park (RICH), Appomattox Court House NHS (APCO), Petersburg National Battlefield Park (PETE), Fredericksburg and Spotsylvania NMP (FRSP), Gettysburg National Military Park (GETT), Eisenhower National Historic Site (EISE), Hopewell Furnace NHS (HOFU), and Valley Forge National Historical Park (VAFO). During FY 2004, the network continued biological inventories and compilation of existing park data to reach its goal of documenting 90% of all vertebrate and vascular plant species present in the network parks. In addition, the network received funding from the vegetation mapping program in FY 2004 to provide for vegetation sampling, classification and mapping in all network parks. The network also received start up vital signs monitoring funding in FY 2004 to hire staff and begin development of a vital signs monitoring program. No water quality monitoring funding was received in FY 2004.

Inventory support to the Appalachian Trail (APPA) from Maine to Georgia was provided by the Mid-Atlantic Network and the Northeast Region from 2000-2002. As of 2003, the Appalachian Trail was participating in 5 networks for vital signs monitoring program development. In 2004, the Northeast Temperate Network took over responsibility for coordinating communication across networks to continue biological inventories and to initiate planning for a vital signs program for the APPA. Inventory funding for APPA was provided to MIDN in 2004, but activities were coordinated by NETN.

FY 2004 Network Objectives for Biological Inventories

- Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
- Conduct inventories targeted at vertebrate and vascular plant species in the Network parks and conduct quality assurance and review of all inventory products.
- Conduct investigations on species and species assemblages that are of special concern to network parks and conduct quality assurance and review of all inventory products.
- Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program and conduct quality assurance and review of all inventory products

Summary of Major Network Accomplishments During FY 2004 – Throughout FY 2004, the network continued to fund ongoing data management projects that include, compiling and entering existing data, legacy data, into NPSpecies, NatureBib and the Dataset Catalog. The NPSpecies database for all parks is verified and current but there are still gaps in documentation of 90% of species. The bird data for EISE, GETT, HOFU, and VAFO were certified for accuracy by a taxonomic expert from Penn State University (PSU). We are awaiting the completion of a number of vertebrate inventories and vegetation mapping projects in the Network to add vertebrate inventory data for the VA parks and floristic (vascular plant) data from the Plots database (from NatureServe) for all network parks. Taxonomic experts have been identified to review NPSpecies for some of the parks in the Network and certification will take place as the data becomes available.

A cooperative agreement with PSU to update NatureBib for the four Northeast Region Networks, including the Mid-Atlantic Network is continuing. The research associate from PSU hired to correct and update NatureBib has been visiting each park to search for new documents and update existing information, resulting in 872 new records and 747 records edited for content and accuracy for PETE,

SHEN, and VAFO.

Since FY 2002, Northeast Region has distributed written "product specifications" that specify formats for biological inventory and other deliverables that are received from cooperators, such as, FGDC compliant metadata for all spatial data sets, FGDC Biological Profile for all biological data sets, and relational databases in MS Access. These were included in each cooperative agreement established for vertebrate inventories (funded by I&M, regional science or park funds) since 2002. The Coastal and Barrier Network data manager assisted and/or developed relational databases and worked with MIDN biological inventory cooperators to assure quality products at the completion of each project. Communications with Network cooperators continued in FY 2004 for inventories funded in 2002 and 2003, and indicate that all are following the product specifications. Where necessary, network and regional staff are providing support to cooperators to ensure that the standards are met.

Incoming data and reports from biological inventories are being peer reviewed for scientific content, accuracy and error. A cooperative agreement was amended with Penn State University, Dr. Richard Yahner to continue scientific peer review of incoming vertebrate inventory reports for Northeast Region Networks. Electronic databases are reviewed for accuracy and error and assistance is provided in developing FGDC compliant metadata.

Herpetological and avian inventory products from Penn State University, Dr. Richard Yahner, et al. funded by the I&M program and regional science program prior to FY 2002 (in FY00 and FY01) in the four PA Network parks, GETT, EISE, HOFU and VAFO, have been submitted. Since these projects were funded prior to the development of product specifications and a good description of database deliverables, the data was converted to new formats. Through a cooperative agreement with North Carolina State University and with assistance from park staff and the Coastal and Barrier Network data manager, a relational database was developed to house much of this incoming data and data dictionaries and FGDC compliant metadata have been developed with the cooperators to ensure proper documentation of all products. Reports were peer reviewed for content and databases were reviewed for accuracy and error.

Mammal inventories in network parks are underway in 2004. Dr. Ron Barry, Frostburg University, continues a third field sampling season at RICH with two new species being recorded in the park, bringing the total to 19 species. Surveys have been initiated in FRSP, with 11 species confirmed in the park this year through trapping and observations; all are new registers for the park. Dr. John Pagels, Virginia Commonwealth University completed the second year of sampling. In total, 139 mammals representing 7 species were captured at PETE (Eastern Front), 231 mammals representing 12 species were captured at PETE (Five-Forks), 247 mammals representing 14 species were captured at APCO, and 242 mammals representing 14 species were captured at BOWA. Camera trapping attempts at the three parks have proven to be very successful, documenting both *Felis rufus* (Bobcat) and *Canis latrans* (Coyote) within PETE (Five-Forks) boundaries. This brings the mammal species count to 21 at PETE, 19 at APCO, and 18 at BOWA. Both capture success and species richness has been noticeably higher than in 2003 which were limited by an extremely wet spring and the effects of Hurricane Isabel in September 2003. Dr. Jim Hart, The Nature Conservancy, has initiated an inventory of bats at the four MIDN Pennsylvania parks, EISE, GETT, HOFU, and VAFO. During 2004, five sites in GETT and EISE have been sampled using mist nets, resulting in the capture of 31 bats representing 3 species. The number of big brown bats (*Eptesicus fuscus*) caught along Plum Run may indicate the presence of a stable summer roosting site in the vicinity of the forested habitat Barns were visually inspected, and several summer bat maternity roosting sites were discovered. Surveys will continue over the next year.

Bird inventories of the VA parks are near completion under a cooperative agreement with the Center for Conservation Biology at the College of William and Mary. Dr. Dana Bradsaw has searched for and cataloged all verifiable records of birds occurring within park boundaries, developed an expected species list for each park and conducted targeted avian inventories to fill information gaps at APCO, BOWA, PETE, RICH and FRSP. Field sampling was completed during the fall of 2003, hampered by the effects of Hurricane Isabel in mid-September, with a final species count of 94 species at APCO, 96 at BOWA, 118 at FRSP, 136 at PETE, and 142 at RISH. Data analysis and report preparation was conducted throughout 2004 and we expect to receive the final deliverables in FY 2005.

Through a cooperative agreement with Dr. Joseph Mitchell, University of Richmond, herpetological inventories at FRSP, RICH, BOWA, PETE and APCO began in October 2002 and were completed in July 2004. A total of 17 species of amphibians and 13 reptiles have been documented for APCO, 9 and 9 for BOWA, 21 and 21 for FRSP, 20 and 27 for PETE, and 23 and 21, respectively, for RICH. New county records and range extensions for several species, mostly frogs and salamanders, have been documented: two species of frogs new to Henrico County, Virginia, were documented in the Fort Harrison unit of RICH, one species of frog and two species of salamanders have been newly documented for the Piedmont Physiographic Province and Dinwiddie County, Virginia, in the Five Forks unit of PETE, a salamander of special interest in Virginia, the rarely-seen mole salamander, was documented for APCO and a frog of special interest in Virginia, the carpenter frog, was documented for the Stonewall Jackson Shrine in FRSP. Park personnel have supplied information and in some cases photographs of amphibians and reptiles they have encountered or have picked up and frozen road-killed snakes. These valuable observations provided new information on several species. Final reports for the herpetological surveys will be made available in FY 2005.

Fish inventory data collected at APCO, BOWA, FRSP, PETE and RICH by the fisheries staff of SHEN, during 2003 were summarized and entered into NPSpecies. Park specific databases and an annual progress report were also submitted to each park inventoried during 2003. During 2004, inventory efforts were completed at APCO, BOWA, EISE, FRSP, GETT and VAFO by SHEN staff. Stream sections in APCO and BOWA were resampled during late spring to provide some contrast to the late summer sampling effort within these parks in 2002. Selected stream sections in FRSP were resampled during early spring in an attempt to detect anadromous shad and again in late summer to take advantage of a return to normal flow conditions following the drought of 2002. Intensive sampling efforts were completed in stream sections within EISE and GETT during August and early September.

SHEN natural resource staff and their contacts have been invaluable in gathering and processing fish data for the MIDN and some Northeast Coastal and Barrier Network (NCBN) parks in Virginia. During early October, a crew from the Pennsylvania Fish and Boat Commission (PFCB) completed an electrofishing survey along the section of the Schuylkill River that flows through VAFO. In addition to participation from the fisheries biologist and crew from SHEN, sampling efforts at APCO and BOWA included equipment and personnel from the Virginia Department of Game and Inland Fisheries (VDGIF), while sampling at EISE and GETT included personnel and equipment from the PFBC. A total of 15 sites along 10 streams were sampled in all MIDN parks combined during 2004. A number of fish species were added to the network parks inventory this year both within streams that had been previously sampled and within streams that were sampled for the first time during 2004. All associated data entry and verification were completed for the 2004 field season in September. Finally, through a cooperative agreement with scientists from the Penn State Institutes for the Environment, a fisheries survey for HOFU was published this year and has resulted in 17 species records for the park.

A new cooperative agreement was established between with Dr. Bob Carline and Dave Lieb of Pennsylvania State University to inventory crayfish species at Pennsylvania NPS units, including EISE, GETT, HOFU and VAFO. Introduction of non-native crayfish species are a great threat to native crayfish, especially in PA, but resource managers lack sufficient baseline information. The inventory will result in updated crayfish species lists for each park, and preliminary survey plans were developed during the summer of 2004.

In developing an inventory study plan in 2000 and 2001, the network made a decision to spend limited funds on vertebrate inventories and surmised that vegetation sampling plot data, as is required for vegetation classification and mapping, might substantially fill the vascular plant data gap. To that end, vegetation mapping is underway in all of the network parks. Cooperators for Network vegetation mapping over the past few years have included: 1. The Nature Conservancy, PA Science Office, PA Natural Diversity Inventory, 2. NatureServe, 3. Virginia Division of Natural Heritage, 4. North Carolina State University, 5. Richard Easterbrook, PETE GIS Specialist and COTR for air photos, 6. Kucera International, Inc., and 7. staff in each network park who are essential in the field operations and data review.

In Pennsylvania, PANDI has completed vegetation mapping products for VAFO and HOFU which are currently undergoing review and revision. The standardized review process identified in FY 2003 has resulted in the completion of a report prepared by NCSU, "QA/QC Procedures for Vegetation Mapping Products", that outlines a standardized review, data distribution and data archiving process for vegetation mapping products. Vegetation classification sampling was completed at GETT and EISE, resulting in 70 plots on approximately 90% of all formation-level polygons. During the sampling, a number of new locations were discovered for Pennsylvania state threatened and endangered plant species, including Hoary Puccoon (*Lithospermum canescens*), Eastern Beardtongue (*Penstemon laevigatus*), Northern Adder's-tongue (*Ophioglossum pusillum*), Short-Fruited Rush (*Juncus brachycarpus*), and Pencilflower (*Stylosanthes biflora*). In the Virginia parks, the Virginia Division of Natural Heritage has continued to sample vegetation at APCO, BOWA, FRSP, PETE, and RICH, with an additional 28 quantitative plots and 331 observation points collected. Several unique and globally rare wetlands were documented this season, including Non-riverine Saturated Forest**,** Coastal Plain Depression Wetland, and Coastal Plain/Piedmont Acidic Seepage swamp, at FRSP, and a small occurrence of Upland Depression Swamp at APCO.

Two additional inventories have been initiated over the past year. Tonnie Maniero from Air Resources Division completed the air quality considerations report for the MIDN. The report outlines the existing federal and non-federal air quality monitoring programs and locations of monitors. Bruce Heise, Geological Resources Division, organized a geologic scoping meeting for parks in Pennsylvania, including the four MIDN parks, as part of the Geologic Resources Evaluation. In collaboration with USGS staff, current geologic maps and resources were evaluated, and plans are underway to conduct a similar scoping meeting for the MIDN parks in VA in 2005.

FY 2004 Network Objectives for Vital Signs Monitoring

- Hire and retain professional staff and provide a safe, healthy, and productive work environment.
- Develop and maintain working and decision-making processes that engage the network board of directors, technical staff, cooperators and managers of network parks.
- Develop, implement, and maintain a Network data management program. (Note: this objective is placed under Vital Signs monitoring, however, it is equally important and integrated with the Biological Inventories portion of the program.).

- Identify and prioritize Network Vital Signs, develop protocols and implement programs to monitor these Vital Signs in Network parks.
- Integrate water quality monitoring in the Network Vital Signs monitoring plan.

Summary of Major Network Accomplishments During FY 2004 – The Mid-Atlantic Network received $150,000 start-up funding in 2004 to begin developing a monitoring program. The Network Coordinator vacancy was re-announced and interviews were conducted in March 2004. Dr. James Comiskey was selected from among the eligible candidates, and started in May based at the Natural Resources Office in Fredericksburg & Spotsylvania NMP. The Mid-Atlantic Network (MIDN) office was set up with support from FRSP staff and the other NER I&M Networks. It was determined that support provided by NCSU for data management would be sufficient to carry the network through to FY 2005, and hence the Data Manager position was put on hold and the limited funds used to advance the network scoping activities.

In support of data management of MIDN and Northeast Region I&M, NCSU has worked with cooperators and contractors to assure that natural resource inventory data are georeferenced according to national standards and are spatially consistent with GIS data for the corresponding parks. Specifically for MIDN vertebrate inventories of the PA parks, NCSU has verified GIS vector data, reviewed tabular data for completeness and internal consistency, verified that complete, FGDC compliant metadata exists and created biological metadata for each dataset, constructed Microsoft Word formatted data dictionaries for each dataset, reviewed orthophotos created by others and creating digital orthophoto mosaics for the VA parks and GETT and EISE, and developed vegetation map data review procedures. NCSU will compile and distribute base GIS data for the MIDN in FY2006. A cataloging and archiving system for I&M data, including digital orthophoto mosaics is currently being developed and implemented.

During 2004, the Network Coordinator made site visits to all the network parks. Visits were coordinated with the Natural Resource staff at each park, and focused on gathering information on each park's natural resources, management issues and threats, current projects, and potential vital signs. The coordinator started compiling information for the network library, including general, management plans, resource management plans, strategic plans, and various reports, which are being used to prepare a series of park profiles. Further assistance to the network is being provided by Carolyn Davis, NNL Coordinator based at GETT, who is helping to compile information for the Phase I report which is due in October 2005. Additional information gathering on existing and historic monitoring outside the park boundaries of relevance to the network is also underway.

Under a cooperative agreement with the Environmental Data Center (EDC) at the University of Rhode Island, the webpages for the MIDN and for SHEN I&M prototype program have been developed in 2004. These sites are now available to both the public and Park Service resource managers, and contain general overviews and summaries of the network's various inventory and monitoring programs and initiatives, present photo galleries introducing visitors to the natural resources in the parks, and as clearinghouses for the distribution of scientific data and reports.

Northeast Region I&M staff continue to assist park resource managers as information becomes available to identify and review existing natural resource studies and data sets for network parks; analyze, consolidate and synthesize this information to identify the natural resource characteristics and conditions in the context of each park's purpose and mission; identify issues and opportunities that should be addressed during the GMP process; identify critical gaps in the knowledge base which must be addressed prior to initiating the planning process; identify usable natural resource data to better

inform the GMP process; present the results of this work to park planners and managers in a way that is understandable and useable in the park planning and management process(s); and identify a cadre of knowledgeable natural resource professionals that would continue in an advisory role during each park's planning process. Specifically, during 2004, the Network Coordinator has worked with VAFO and regional staff to provide scientific support for the vegetation management plan.

Through a cooperative agreement initiated by the MIDN with the Patuxent Wildlife Research Center, USGS, a study was started in 2004 to develop a sampling design for evaluating the long-term contribution of cultural parks to the conservation of grassland and shrubland birds, focusing primarily on the MIDN, the Eastern Rivers and Mountains Network (ERMN), and the National Capital Region Network (NCRN). The project will evaluate whether grassland and shrubland birds can be used as indicators for cultural landscape integrity and habitat quality, identify the potential of these parks to support significant breeding communities, provide recommendations concerning management activities, and for parks supporting significant bird communities, design and establish a multi-regional monitoring framework that could be implemented on federal and adjacent non-federal lands. In 2004, Dr. Bruce Peterjohn conducted visits to potential pilot project sites including Gettysburg National Military Park from the MIDN, Antietam National Battlefield and Manassas National Battlefield from the NCRN, and Fort Necessity National Battlefield from the ERMN. A questionnaire has been developed which will be sent out to natural resource managers in the three networks.

FY 2004 Network Objectives for Water Quality Monitoring

The network did not receive water quality monitoring funding in FY2004, but is scheduled for funding in 2005. As part of the data mining process, water quality inventory data and spatial hydrology layers will be assembled and cooperators will be located to report on 305 (B) and 303(D) reporting for network parks.

Public Interest Highlights (MIDN 2004)

Bobcat and Coyote documented in Petersburg National Battlefield

Using night camera traps, *Felis rufus* (Bobcat) and *Canis latrans* (Coyote) were documented in Dinwiddie County within PETE (Five-Forks) boundaries.

Cedar waxwing breeding extension confirmed in MIDN parks

Bird surveys in Mid-Atlantic network parks yield increasing observations of breeding cedar waxwings confirming an extension in the breeding range of this species.

Rare plants identified during vegetation mapping at Gettysburg and Eisenhower sites

As part of vegetation sampling, classification and mapping at Gettysburg National Military Park and Eisenhower National Historic Site, cooperators discovered a number of new locations for Pennsylvania state threatened and endangered plant species, including Hoary Puccoon (*Lithospermum canescens*), Eastern Beardtongue (*Penstemon laevigatus*), Northern Adder's-tongue (*Ophioglossum pusillum*), Short-Fruited Rush (*Juncus brachycarpus*), and Pencilflower (*Stylosanthes biflora*).

Globally rare wetlands documented at Appomattox Court House National Historical Park and Fredericksburg & Spotsylvania National Military Park during Mid-Atlantic Network vegetation mapping

Cooperators have found additional examples of unique and globally rare wetlands at Appomattox Court House National Historical Park (APCO) and Fredericksburg & Spotsylvania National Military Park (FRSP) as part of the vegetation mapping program. These include, examples of Non-riverine Saturated Forest, Coastal Plain Depression Wetland, and Coastal Plain/Piedmont Acidic Seepage swamp at FRSP, and a small occurrence of Upland Depression Swamp was documented at APCO.

Partnerships formed to conduct Mid-Atlantic Network freshwater fish inventory

A partnership formed with the Pennsylvania Fish and Boat Commission as the result of the fisheries inventory work conducted by the Shenandoah National Park staff has played a key role in conducting fisheries inventories in Mid-Atlantic Network parks. Several fisheries biologists from the Pennsylvania Fish and Boat Commission provided assistance in the form of additional personnel and/or specialized equipment for field sampling efforts at Valley Forge National Historical Park, Gettysburg National Military Park, and Eisenhower National Historic Site.